

MORTALITY EVALUATION
AT
JAMES J. ROWLEY TRAINING CENTER
BELTSVILLE, MARYLAND

Prepared by:
Rodney L. Whiteman
Forestry Technician

USDA Forest Service
Forest Health Protection
Morgantown, WV

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Introduction

James J. Rowley Training Center (JJRTC) is a 500 acre Secret Service training facility located at Beltsville, Maryland (Figure 1). This facility is bordered to the west by the Baltimore-Washington Parkway and to the south by Powder Mill Road. Approximately 334 acres of JJRTC are forested. The principle tree species present include southern red oak, white oak, scarlet oak and sweet gum. Other tree species present in smaller quantities include black gum, red maple, holly, beech, red oak and loblolly pine. Significant gypsy moth caused tree mortality has occurred on site since 1989.

Gypsy moth populations at JJRTC first reached defoliating levels during the summer of 1989 and caused 4.9 acres of moderate defoliation (31-60 percent) and 30 acres of heavy defoliation (61-100 percent). Gypsy moth populations were still high during the summer of 1990 causing 93.9 acres of moderate defoliation and 22.5 acres of heavy defoliation. An aerial application of Bacillus thuringiensis (B.t.) was conducted in the spring of 1991. This B.t. treatment successfully protected tree foliage as no noticeable defoliation occurred during the summer of 1991. An extremely low gypsy moth population presently exists at JJRTC. This population is not expected to cause any noticeable defoliation in 1992.

This report shows the location and extent of this mortality; discusses the probable cause and possible impacts of this mortality; and recommends measures to prevent additional mortality.

Methods

Using low level 9"x9" color infrared photography taken during the summer of 1991, areas of mortality were delineated, placed on a site map of JJRTC, and classified according to the severity of the mortality. Areas where 25 to 50 percent of the trees are dead were classified as heavy mortality while areas where 51 to 100 percent of the trees are dead were classified as severe mortality. In order to verify the interpretation of the CIR photography, fifteen 10 BAF prism plots were randomly established in these mortality areas during December of 1991. Tree species, diameter (dbh), crown class (dominant, codominant, intermediate or suppressed), and tree condition (living or dead) were recorded for all "in" trees at each plot. The data from each plot not only provided information on the severity of mortality in a particular area but also the severity of mortality by tree species and crown class.

Results

A total of 60.8 acres of mortality has occurred at JJRTC since the summer of 1989. Heavy mortality accounts for 1.2 acres while severe mortality accounts for 59.6 acres (Figure 2). Individual or small groups of dead trees (<5) are not shown on Figure 2.

One hundred and seventeen (117) of the 176 trees examined in the plots during this mortality evaluation were oaks (either southern red, white, scarlet or red). The remaining 59 trees were non-oaks (either sweet gum, black gum, holly, beech or loblolly pine). A large amount of the mortality has occurred on the oaks while non-oaks have experienced little mortality (Figure 3). Only 9 percent of the oaks were living while 95 percent of the non-oaks were still

living. White oak, southern red oak and scarlet oak were the tree species affected the most by the mortality. Of the 114 trees evaluated that were either white oak, southern red oak or scarlet oak, only 9 of these trees are still living. There was no significant difference in the mortality rate between the overstory trees (dominant and codominant) and the understory trees (intermediate and suppressed).

Basal area is a term used by foresters to describe stand density. It is defined as the total cross sectional area of the trees in the stand measured at 4 1/2 feet above ground level and is expressed in square feet per acre. A typical basal area in a mature forest would range from 100 to 130 square feet per acre. Looking at the mortality areas as a whole, basal area has been reduced from approximately 117 square feet per acre to approximately 44 square feet per acre. This represents a 62 percent reduction in basal area. These areas went from being fully stocked to their present classification of being understocked.

Approximately 138.1 acres of forested land at JJRTC have experienced noticeable gypsy moth defoliation during 1989-1990. The defoliation has varied in both intensity and duration (Figure 4). The intensity and duration of this defoliation has ranged from as little as one year of moderate defoliation to as much as two years of heavy defoliation. Thus, the defoliation history classes range from one year of moderate defoliation to two years of heavy defoliation.

Mortality has occurred in all defoliation history classes. The defoliation history class that had the highest percent of mortality is the two years of heavy defoliation class while the one year of moderate defoliation class had the lowest percent (Table 1). Approximately 95 percent of the acres that sustained two years of heavy defoliation have significant mortality (>25 percent). Only 26 percent of the acres that sustained one year of moderate defoliation have significant mortality. As the intensity and duration of the defoliation increased, the amount of mortality also increased.

Table 1.--Comparison of the percent of acres that were defoliated and have experienced mortality by defoliation history class.

Defoliation History Class	Acres	Acres of Mortality	Percent of Acres Defoliated That Experienced Mortality
2 yrs. heavy defoliation	3.7	3.5	95
1 yr. heavy defoliation, 1 yr. moderate defoliation	8.1	6.9	85
1 yr heavy defoliation	37	19.9	54
2 yrs. moderate defoliation	1.4	0.7	50
1 yr. moderate defoliation	87.9	22.9	26

Most of the mortality occurred in areas that were defoliated in 1989 and/or 1990 (Figure 5). Approximately 53.9 acres out of the 60.8 acres or 89 percent of the mortality is in areas that were defoliated.

Discussion

Trees that are likely to die after they are defoliated are trees that are under stress from other factors such as: 1) soil compaction from roads, sidewalks, parking lots, machinery and/or heavy foot use; 2) previous defoliation; 3) overmaturity; 4) drought; 5) shock due to recent timber cutting; and 6) other insect or disease related problems. Already stressed by one or more of these agents, the additional stress caused by defoliation can lead to a tree's death.

A much greater percentage of the defoliated areas have experienced significant mortality than the undefoliated areas. Of the 334 forested acres at JJRTC, approximately 138.1 acres have experienced noticeable gypsy moth defoliation (>30 percent). About 39 percent (53.9 acres) of this has experienced significant mortality. Only 4 percent (6.9 acres) of the forested area that was never defoliated by gypsy moth experienced significant mortality.

Possible consequences of this mortality include increased maintenance costs, and decreased security.

Maintenance costs are likely to increase from this mortality. More time and consequently more money will have to be spent on maintenance in the mortality areas that are adjacent to the roads or the security fence. In mortality areas near roads, increased maintenance costs will be the result of cleaning up the fallen bark, limbs and eventually the boles of the dead trees. In mortality areas adjacent to the security fence, increased maintenance costs will be the result of repairing the fence when large limbs or entire trees fall on the fence. It may be cost effective to cut down these dead trees before they fall on the fence.

The safety of personnel operating in the mortality areas or on roads that are adjacent to these mortality areas will be decreased due to the falling limbs and or entire trees. This will be especially true on windy days. One way to increase safety in these areas would be to cut down the dead trees before they fall down.

Visual security may be reduced since the trees at this facility act as a visual buffer preventing people outside of the facility from observing the training tactics and techniques of the Secret Service. When the trees in the mortality areas fall over or are removed, it may be easier for people outside the security fence to observe the events inside the fence.

Conclusion

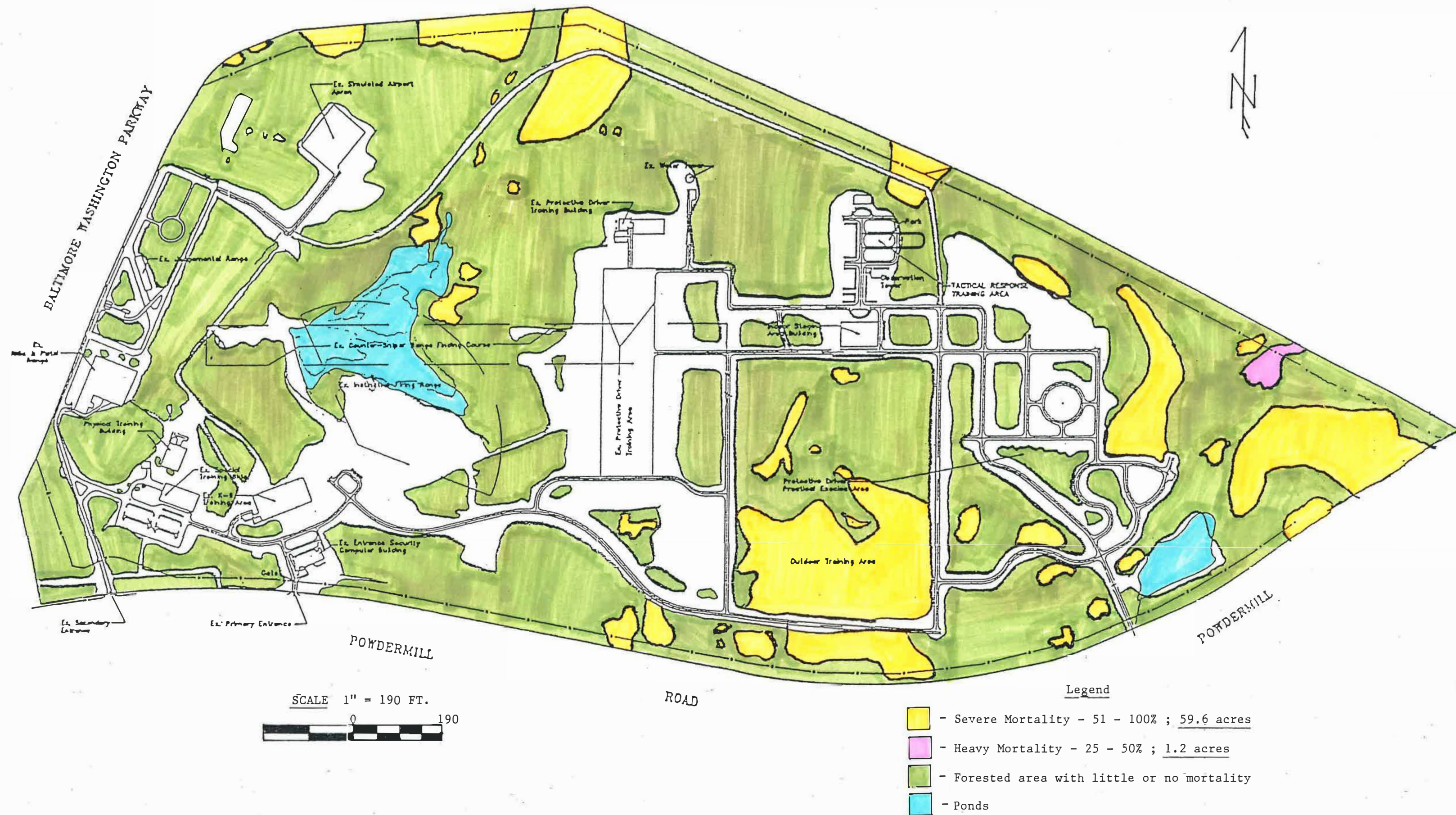
The JJRTC facility contains approximately 60.8 acres of heavy or severe mortality at the present time. Of this mortality, 89 percent of it is located in areas that were noticeably defoliated by gypsy moth in 1989 and 1990. If this defoliation was prevented, most of the mortality could have been prevented.

The mortality that already exists will probably have several negative impacts. Maintenance costs at JJRTC will increase, the safety of personnel operating in the mortality areas will be reduced and visual security might be reduced.

To minimize any further tree mortality, gypsy moth populations should be monitored closely and suppression projects implemented when necessary.

The map is a composite of two maps. The top map is a detailed inset of the U.S. National Agriculture Research Center in Beltsville, Maryland. It shows the research center, Beltsville Airport, and nearby towns like Gaithersburg and Rockville. The bottom map is a larger regional map of Maryland and the Washington, D.C. area. It shows major highways, cities, and the Potomac River. A large black arrow points from the regional map to the detailed inset.

Figure 2. -- Areas and Extent of Mortality at
the James J. Rowley Training Center
as of December 9, 1991



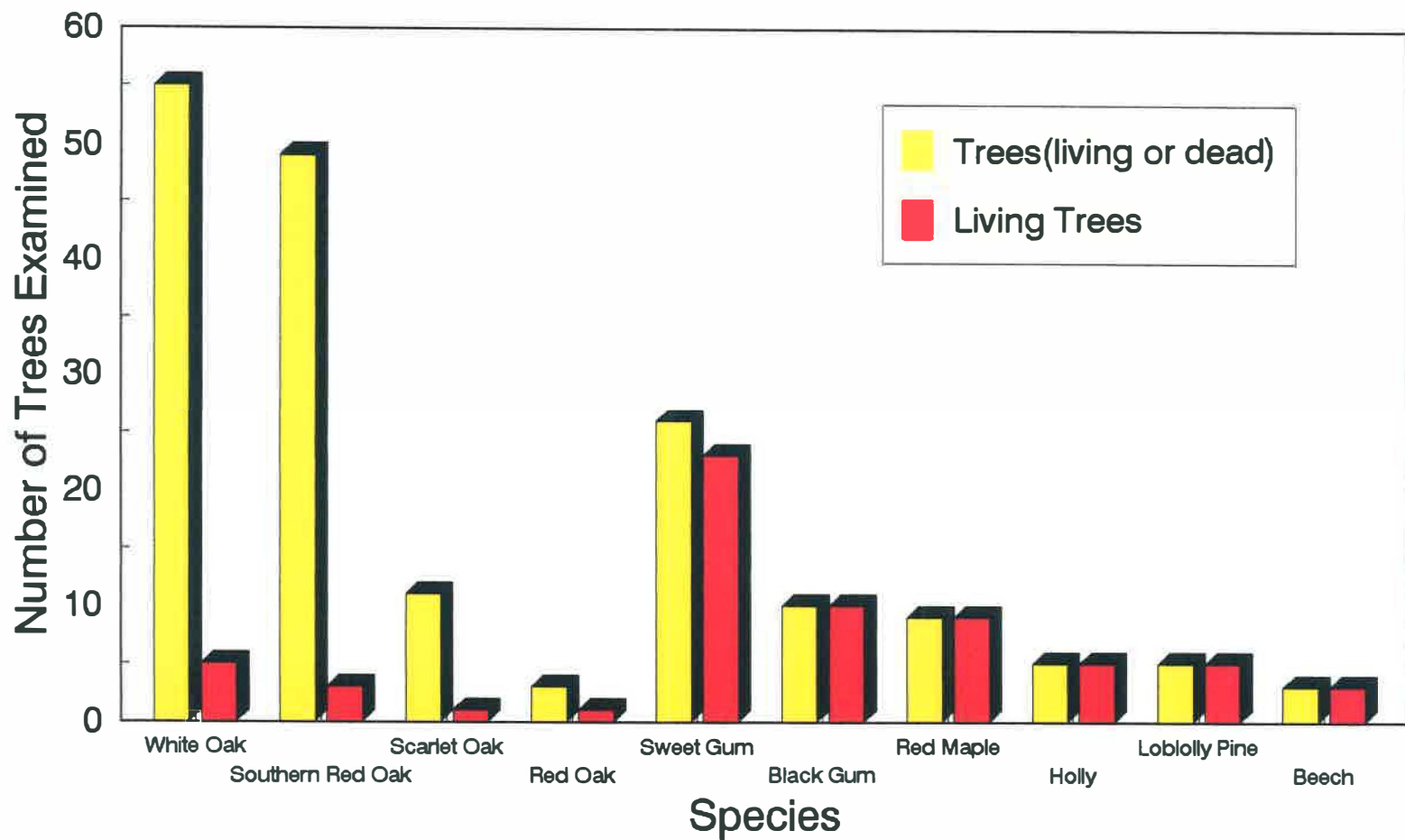


Figure 3. Comparison of the Number of Trees by Species and the Number of Living Trees by Species in the Mortality Areas at JJRTC, 12-9-91

Figure 4. -- Location and severity of defoliation in 1989 & 1990
at James J. Rowley Training Center, Beltsville, MD.



SCALE 1" = 190 FT.
0 190



Legend

- - 1 year of heavy defoliation ; 37 acres
- - 2 years of heavy defoliation ; 3.7 acres
- - 1 year heavy defoliation & 1 year of moderate defoliation ; 8.1 acres
- - 2 years of moderate defoliation ; 1.4 acres
- - 1 year of moderate defoliation ; 87.9 acres

Figure 5. -- Areas of mortality with respect to
1989 & 1990 Gypsy Moth defoliation
at James J. Rowley Training Center





United States
Department of
Agriculture

Forest
Service

Northeastern Area
State & Private
Forestry

180 Canfield Street
Morgantown, WV 26505

Reply To: 3420/3460

Date: March 17, 1992

Mr. Robert MacPherson
U.S. Secret Service
9200 Powder Mill Road
Laurel, MD 20707

Dear Bob:

Enclosed is a copy of the Mortality Evaluation at James J. Rowley Training Center. The report shows the location and extent of the mortality; discusses the probable cause and possible impacts of this mortality; and recommends measures to prevent additional mortality.

Please call me at 304-285-1555 if you have any questions about this report.

Sincerely,

Rodney L. Whiteman

RODNEY L. WHITEMAN
Forestry Technician
Forest Health Protection

Enclosure

cc: AO
Robert Rabaglia

RLW/mae



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